

REMARKS

Applicant notes that claims 34 and 35 have been amended to correct minor deficiencies not previously noted by the Examiner. Applicant has also added claims 38-40 for consideration by the Examiner. No new matter has been added. Applicant notes that the new claims are fully supported by the specification as filed. *E.g. spec.*, pg 4, ll. 18-26; pg. 5, ln. 24 – pg. 6, ln.26. Additionally, claims 38-40 depend directly or indirectly from claim 32 and merely further define the subject matter of claim 32 and any intervening claims. Accordingly, a new search is not required. Applicant respectfully requests the entry of claims 38-40.

The present invention is a tube-forming device for notching and/or punching a tubular work piece. The tube-forming device comprises a work piece holder to hold the tubular work piece, a tool insertable into an end of the work piece, a tool holder to hold the tool, and a dual action rotating cam assembly. The rotating cam assembly comprises first and second rotating cams disposed on a common shaft such that the cams rotate about the same axis. The rotating cams drive the tool in a first direction during a first phase of a tool cycle, and in a second direction during a second phase of a tool cycle. During a third phase of the tool cycle, the rotating cam assembly is idle.

The Examiner rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Vernacchio in view of Tseng. Claim 15 recites, “a dual action rotating cam assembly to drive the tool holder in a first direction during a first phase of a tool cycle to engage the tool with a first side of the work piece, and to drive the tool holder in a second direction during a second phase of the tool cycle to engage the tool with a second side of the work piece.” The dual action rotating cam assembly thus allows a two-phase tool cycle system in which the tool holder is driven in first and second directions, such that the tool engages first and second sides of the interior of the tubular work piece, respectively. The Examiner admits that Vernacchio fails to disclose this limitation, but asserts that the patent to Tseng does. Applicant disagrees for at least two reasons.

First, the patent to Tseng does not disclose what the Examiner says it does. Tseng discloses an electronic paper punch having a series of horizontally aligned eccentric wheels. Each wheel rotates to drive a corresponding punch pin in a forward direction such that the pins punch through a first side of one or more sheets of paper. Once the pins are through the paper, the wheels are rotated in a reverse direction to retract the pins from the newly formed holes. *Tseng*, col. 2, ln. 64 – col. 3, ln. 5. During the reverse rotation of the eccentric wheels, however, the pins never engage “a second side” of the paper. Instead, the pins are merely retracted through the newly formed holes such that they return to their original positions. Indeed, because the forward movement of the pins punches holes in the paper, there is no second side of the paper for the pins to engage upon retraction. As such, not only does the patent to Tseng not teach claim 15, it necessarily cannot even suggest claim 15.

Second, even if the patent to Tseng could be construed to disclose what the Examiner suggests (which it cannot), the § 103 rejection still fails because the combination of Vernacchio and Tseng fails to produce the invention of claim 15. Vernacchio discloses a piston that forces a cutting tool to engage the interior of a tube when it moves in a first direction only. Moving in the second direction (urged by a spring), the piston simply returns to its starting position without ever engaging the second side of the tube. According to Vernacchio, the operator is *required* to remove, reinsert, and align the tube in the housing to make the second cut. Still, the second cut is only made when the piston drives the tool in the first direction. *Vernacchio*, col. 3, ll. 24-49. Vernacchio never suggests that the piston can drive the tool to engage the interior of the tube in first and second directions. The fact that Vernacchio includes alignment markings to assist the operator in reinsertion and alignment of the tube only serves to evidence this fact. *Vernacchio*, col. 3, ll. 16-20.

Thus, both Vernacchio and Tseng are specifically designed to engage their respective work products in a first direction only – never in a first and a second direction as explicitly recited by claim 15. Even if one skilled in the art could drive the piston of Vernacchio with the

eccentric wheels of Tseng as the Examiner suggests, the result would still be a tool that engages a work product in a first direction only. As such, neither Vernacchio nor Tseng, alone or in combination, teach or suggest claim 15. Accordingly, Applicant respectfully requests the allowance of claim 15, and its dependent claims 16-29.

The Examiner also rejected claims 30 and 32 under § 103 over Vernacchio in view of Tseng for the same reasons as those stated above. However, claim 30 contains language that requires a rotating dual action cam assembly to drive a tool in first and second directions to engage first and second sides, respectively, of a work piece. Claim 32 explicitly recites that the rotating cam assembly drives the tool holder in first and second directions during the first and second phases of the tool cycle. Therefore, neither Vernacchio nor Tseng, alone or in combination, teach or suggest either of claims 30 or 32. Accordingly, Applicant respectfully requests the allowance of claims 30 and 32 15, as well as their respective dependent claims 31 and 33-40.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

By:


Stephen A. Herrera
Registration No. 47,642

P.O. Box 5
Raleigh, NC 27602
Telephone: (919) 854-1844